This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Municipal permit. The discharge results from the operation of a 0.0078 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260-00 et seq.

1.	Facility Name and Mailing Address:	Hartwood Elementary School 31 Stafford Ave. Stafford, VA 22554	SIC Code :	4952 WWTP
	Facility Location:	14 Shackleford Well Road Hartwood, VA 22406	County:	Stafford
	Facility Contact Name:	Stacey Gentry	Telephone Number:	(540)379-6068
2.	Permit No.:	VA0060348	Expiration Date of previous permit:	6/30/2012
	Other VPDES Permits associated with this facility:		None	
	Other Permits associated with this facility:		None	
	E2/E3/E4 Status:	Not Applicable (NA)		
3.	Owner Name:	Stafford County School Board		
	Owner Contact:	Dr. Randy Bridges	Telephone Number:	(540)658-6000
	Owner Contact Title	Superintendent of Public Schools		
4.	Application Complete Date:	February 1, 2012		
	Permit Drafted By:	Alison Thompson	Date Drafted:	February 14, 2012
	Draft Permit Reviewed By:	Joan Crowther	Date Reviewed:	March 26, 2012
	WPM Review By:	Bryant Thomas	Date Reviewed:	April 3, 2012
	Public Comment Period :	Start Date: May 4, 2012	End Date:	June 4, 2012

5. Receiving Waters Information: See Attachment 1 for the Flow Frequency Determination

Receiving Stream Name :	Horsepen Run, UT	Stream Code:	3-XDY
Drainage Area at Outfall:	1.2 sq.mi.	River Mile:	0.42
Stream Basin:	Rappahannock River	Subbasin:	NA
Section:	4d	Stream Class:	III
Special Standards:	None	Waterbody ID:	VAN-E19R
7Q10 Low Flow:	0.0 MGD	7Q10 High Flow:	0.0 MGD
1Q10 Low Flow:	0.0 MGD	1Q10 High Flow:	0.0 MGD
30Q10 Low Flow:	0.0 MGD	30Q10 High Flow:	0.0 MGD
Harmonic Mean Flow:	0.0 MGD	30Q5 Flow:	0.0 MGD
303(d) Listed:	Receiving Stream – No		
303(d) Listed:	Downstream – Yes (Bacteria/PCBs in fish tissue)		
TMDL Approved:	Receiving Stream -NA	Date TMDL Approved:	NA
TMDL Approved:	Downstream – Yes (bacteria)	Date TMDL Approved:	5/5/2008
TMDL Approved:	Downstream – No (PCBs)	Date TMDL Approved:	Expected in 2016

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

✓	State Water Control Law	___	EPA Guidelines
✓	Clean Water Act	✓	Water Quality Standards
✓	VPDES Permit Regulation	___	Other
✓	EPA NPDES Regulation		

7. Licensed Operator Requirements: Class IV

8. Reliability Class: Class II

9. Permit Characterization:

___	Private	___	Effluent Limited	___	Possible Interstate Effect
___	Federal	✓	Water Quality Limited	___	Compliance Schedule Required
___	State	___	Toxics Monitoring Program Required	___	Interim Limits in Permit
✓	POTW	___	Pretreatment Program Required	___	Interim Limits in Other Document
___	TMDL				

10. **Wastewater Sources and Treatment Description:**

The treatment works consists of two 5,000-gallon septic tanks and a package plant. One 5,000-gallon septic tank serves the cafeteria, and the other septic tank services the rest of the school. The package plant has a design capacity of 0.0078 million gallons per day (MGD). Wastewater from the septic tanks flows to a surge tank, followed by 2 aeration basins, clarifier, tablet chlorination and contact tank, dechlorination and post aeration, as well as aerated sludge holding. The settled sludge from the clarifier is returned to the aeration basin or wasted to the aerated sludge holding tank. The final effluent is piped and discharges via cascaded step aeration to a drainage ditch, which is a UT of Horsepen Run. At the end of the steps, the discharge disappears, reappears on the opposite bank to mix with the UT, and then disappears and reappears several times as it travels to Horsepen Run.

The final effluent from the Hartwood Elementary School sewage treatment plant discharges into a dry drainage ditch. The ditch originates, and drains the stormwater runoff away from the school site, meandering into a wooded area behind the school. It slopes down about 60 feet in elevation over a distance of 0.4 mile before joining another unnamed tributary to Horsepen Run. The outfall is approximately 0.8 mile away from Horsepen Run. The discharge is classified as intermittent and seasonal as the flow is based on when the school is in session.

See Attachment 2 for a facility schematic/diagram.

TABLE 1 – Outfall Description

Outfall Number	Discharge Sources	Treatment	Design Flows	Outfall Latitude and Longitude
001	Domestic Wastewater	See Item 10 above.	0.0078 MGD	38° 24' 08" N 77° 33' 45" W
See Attachment 3 for (Storck, DEQ #183A) topographic map.				

11. **Sludge Treatment and Disposal Methods:**

Sludge is held in an aerated sludge holding tank until it is transported to the Little Falls Run WWTF (VA0076392)

12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge

TABLE 2	
TYPE	DESCRIPTION
3-RPP113.37	DEQ Monitoring Station located approximately 11 miles downstream at the USGS cableway on the Rappahannock River.
01668000	USGS Monitoring Station is also located at the USGS cableway on the Rappahannock River.

The PWS intake for Abel Lake WTP is located within a 5 mile radius. However, this intake is located in waterbody VAN-A29R, in the Potomac River watershed and this discharge is in the Rappahannock Basin.

13. Material Storage

TABLE 3 - Material Storage		
Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Soda Ash	3-4 5-gallon buckets	Stored in locked red shed at STP
Sodium Hypochlorite	3-4 5-gallon buckets	Stored in locked red shed at STP
Sodium Bisulfite	3-4 5-gallon buckets	Stored in locked red shed at STP

14. Site Inspection:

Performed by Alison Thompson on February 13, 2012. (Attachment 4).

15. Receiving Stream Water Quality and Water Quality Standards:

a) Ambient Water Quality Data

The nearest downstream DEQ monitoring station is 3-RPP113.37, located at the USGS cableway on the Rappahannock River, approximately 11.0 miles downstream of Outfall 001. In the 2010 Integrated Report, the aquatic life, public water supply, and wildlife uses are considered fully supporting. The fish consumption and recreation uses were not assessed.

There are two downstream impairments on the Rappahannock River:

Recreation Use (*E. coli*) – The impairment begins approximately 13.7 miles downstream of Outfall 001; Sufficient excursions from the maximum *E. coli* bacteria criterion (11 of 42 samples - 26.2%) were recorded at DEQ's ambient water quality monitoring station (3-RPP110.57) at the Route 1 crossing, and at Station 107.91 (4 of 31 samples (12.9%) to assess this stream segment as not supporting of the recreation use goal for the 2010 water quality assessment.

Fish Consumption Use (PCBs in Fish Tissue) – The impairment begins approximately 13.7 miles downstream of Outfall 001; The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. The advisory, dated 12/13/04, limits American eel, blue catfish, carp, channel catfish, croaker, gizzard shad, and anadromous (coastal) striped bass consumption to no more than two meals per month. The affected area extends from the I-95 Bridge above Fredericksburg downstream to the mouth of the river near Stingray Point, including its tributaries Hazel Run up to the I-95 Bridge crossing and Claiborne Run up to the Route 1 Bridge crossing. In addition, excursions above the water quality criterion based tissue value (TV) of 20 parts per billion (ppb) for polychlorinated biphenyls (PCBs) in fish tissue were recorded in four species of fish (7 total samples) collected in 2006 at monitoring station 3-RPP107.33 (blueback herring, blue catfish, gizzard shad, striped bass). As a result, the waters were assessed as not supporting the fish consumption use goal.

The full planning statement is found in Attachment 5.

b) Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream Horsepen Run, UT is located within Section 4d of the Rappahannock River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

Attachment 6 details other water quality criteria applicable to the receiving stream.

Ammonia:
The 7Q10 and 1Q10 of the receiving stream are 0.0 MGD. In cases such as this, effluent pH and temperature data may be used to establish the ammonia water quality standard. Staff has re-evaluated the effluent data for pH and temperature using the January 2011 to December 2011 data. The 90th percentile pH was determined to be 7.4 S.U. and the 90th percentile temperature is 23°C. See Attachment 6 for the derivation of the 90th percentile values of the effluent pH and temperature data.

Metals Criteria:
The Water Quality Criteria for some metals are dependent on the receiving stream's total hardness (expressed as mg/L calcium carbonate). The 7Q10 of the receiving stream is zero and no ambient data is available, so the effluent data for total hardness can be used to determine the metals criteria. The total hardness-dependent metals criteria in Attachment 6 are based on an effluent value of 73 mg/L. This value was derived from data collected from September 2000 to March 2002. There is no new data and there have been no changes to the treatment plant since these values were obtained, so the 73 mg/L shall be carried forward with this reissuance.

Bacteria Criteria:
The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

1) *E. coli* bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 ml)	126

[2]See 9VAC25-260-140 C for fresh[water] and transition zone delineation

As part of the application for reissuance, the facility collected three *E. coli* samples. All three results were <1 n/cmL. Since the facility does not have a WLA as part of an approved TMDL, and the receiving stream is not listed as impaired, no further *E. coli* monitoring is included with this draft. The draft permit does require chlorine monitoring which is used as a surrogate to demonstrate adequate disinfection.

c) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Horsepen Run, UT, is located within Section 4d of the Rappahannock Basin. This section has been designated with no special standards.

d) Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on February 3, 2012, for records to determine if there are threatened or endangered species in the vicinity of the discharge. No threatened or endangered species were identified. The search has been placed in the reissuance file.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1. The critical flows for the stream are zero and at times the stream flow is comprised of only effluent. It is staff's best professional judgment that such streams are Tier I. Permit limits proposed have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. In this case since the critical flows 7Q10 and 1Q10 have been determined to be zero, the WLA's are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:
Effluent data obtained from the Discharge Monitoring Reports (DMRs) has been reviewed and determined to be suitable for evaluation. Effluent data were reviewed for the period January 2009 through December 2011, and the only effluent limitation exceedances occurred in February 2010 for the monthly and weekly averages of the established TKN limitations.

The following pollutants require a wasteload allocation analysis: Total Residual Chlorine and Ammonia as N.

b) Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- Q_s = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- C_s = Mean background concentration of parameter in the receiving stream.

The water segment receiving the discharge via Outfall 001 is considered to have a 7Q10 and 1Q10 of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the C_o.

c) Effluent Limitations Toxic Pollutants, Outfall 001 –

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N/TKN:

During the previous permit reissuances, staff established a TKN limit of 5.0 mg/L. The following excerpt from the 2002 Fact Sheet describes the basis for the TKN limit: "The extended aeration activated sludge treatment plant is designed with capability for meeting an effluent ammonia limit of 2.1 mg/L, which was established based on chronic ammonia criterion when the existing permit was reissued in 1997. Since the plant is found to discharge intermittently, chronic criterion is no longer applicable. To ensure the plant is properly operated and maintained to its full design capability, a TKN effluent limit will be proposed and set at 5.0 mg/L and 7.5 mg/L respectively, for monthly and weekly averages. Several factors go into the deliberation of this TKN effluent limit: (a) A well nitrified effluent from a well designed and operated biological nitrification plant normally contains residual, refractory organic nitrogen in the order of 3 mg/L; (b) The extended aeration plant is designed for a 2.1 mg/L ammonia-N effluent limit; (c) TKN measures the sum of organic nitrogen and free ammonia; and (d) The plant is a small package plant manned about one hour per day. Based on all these considerations, it is the staff's best professional judgment that a TKN effluent limit of 5.0 mg/L is appropriate for this facility and will ensure the plant will be properly operated and maintained to its full capacity". Since this is an intermittent discharge, only the acute criteria and WLAs need to be considered. The calculated acute WLA is 23 mg/L. It is staff's best professional judgment that the TKN limits previously established continue to be protective of water quality and is therefore carried forward with this permit reissuance.

2) Total Residual Chlorine:

Chlorine is used for disinfection and is potentially in the discharge. In accordance with current DEQ guidance, staff used a default data point of 0.1 mg/L and the calculated WLAs to derive limits and determined that there was no significant differences from the previous values established; therefore, the limits will be carried forward with this permit cycle and are as follows: A monthly average of 0.009 mg/L and a weekly average limit of 0.012 mg/L (Attachment 7).

d) Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (D.O.), total suspended solids (TSS), total kjeldahl nitrogen (TKN), and pH limitations are proposed. Since the permit limits TKN, the biochemical oxygen demand (BOD_5) limitations should be expressed as carbonaceous biochemical oxygen demand ($CBOD_5$) limitations, so staff proposes to change the BOD_5 limitation of 24 mg/L to a $CBOD_5$ limitation of 24 mg/L.

Dissolved Oxygen and $CBOD_5$ limitations were originally based on the stream modeling conducted in 1988 and were set to meet the water quality criteria for D.O. in the receiving stream (Attachment 8) and also assume that the stream is free flowing. The design flow for the plant was 0.005 MGD. With the previous two permits, the discharge as well as the stream were considered intermittent with a design flow of 0.0078 MGD; staff could not find documentation as to when the design flow changed. However, staff believed that the D.O., $CBOD_5$, and TKN limits established would continue to protect the D.O. for the receiving stream and carried the established limits forward. Since no significant changes have occurred since the previous reissuance and no problems were identified with the recent inspection of the facility and receiving stream, it is staff's best professional judgment that the D.O., $CBOD_5$, and TKN limitations established in the previous permit cycle continue to be protective of water quality and are carried forward with this permit reissuance.

It is staff's practice to equate the Total Suspended Solids limits with the $CBOD_5$ limits. TSS limits are established to equal $CBOD_5$ limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

e) Effluent Limitations and Monitoring Summary.

The effluent limitations are presented in the following table. Limits were established for Flow, $CBOD_5$, Total Suspended Solids, Total Kjeldahl Nitrogen, pH, Dissolved Oxygen, and Total Residual Chlorine.

The limit for Total Suspended Solids is based on Best Professional Judgment.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD/CBOD and TSS (or 65% for equivalent to secondary). The limits in this permit are water-quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19. Effluent Limitations/Monitoring Requirements:

Design flow is 0.0078 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D	Estimate
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
$CBOD_5$	5	24 mg/L 0.71 kg/d	36 mg/L 1.1 kg/d	NA	NA	1/M	Grab
Total Suspended Solids (TSS)	2	24 mg/L 0.71 kg/d	36 mg/L 1.1 kg/d	NA	NA	1/M	Grab
Dissolved Oxygen	3, 5	NA	NA	6.5 mg/L	NA	1/D	Grab
Total Kjeldahl Nitrogen (TKN)	3,5	5.0 mg/L 0.15 kg/d	7.5 mg/L 0.22 kg/d	NA	NA	1/M	Grab
Total Residual Chlorine (after contact tank)	2, 3, 4	NA	NA	1.0 mg/L	NA	1/D	Grab
Total Residual Chlorine (after dechlorination)	3	0.009 mg/L	0.012 mg/L	NA	NA	1/D	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. Stream Model- Attachment 8

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/D = Once every day.
1/M = Once every month.

Estimate = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.
Grab = An individual sample collected over a period of time not to exceed 15-minutes.

20. Other Permit Requirements:

a) Part I.B. of the permit contains additional chlorine monitoring requirements, quantification levels and compliance reporting instructions.
These additional chlorine requirements are necessary per the Sewage Collection and Treatment Regulations at 9VAC25-70 and by the Water Quality Standards at 9VAC25-260-170. A minimum chlorine residual must be maintained at the exit of the chlorine contact tank to assure adequate disinfection. No more that 10% of the monthly test results for TRC at the exit of the chlorine contact tank shall be <1.0 mg/L with any TRC <0.6 mg/L considered a system failure. Monitoring at numerous STPs has concluded that a TRC residual of 1.0 mg/L is an adequate indicator of compliance with the *E. coli* criteria. *E. coli* limits are defined in this section as well as monitoring requirements to take effect should an alternate means of disinfection be used.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

21. Other Special Conditions:

a) 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.

b) Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200 B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c) O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. Within 90 days of the effective date of this permit, the permittee shall submit for approval an Operations and Maintenance (O&M) Manual or a statement confirming the accuracy and completeness of the current O&M Manual to the Department of Environmental Quality, Northern Regional Office (DEQ-NRO). Future changes to the facility must be addressed by the submittal of a revised O&M Manual within 90 days of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d) CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

e) Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200 C, and Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class IV operator.

f) Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a reliability Class of II.

h) Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

i) Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2., and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

22. Changes to the Permit from the Previously Issued Permit:

a) Special Conditions:
   1) Part II.A of the permit was updated to include VELAP requirements for effluent monitoring.
   2) The Water Quality Criteria Reopener was removed since there are no parameters monitored without limitation.

b) Monitoring and Effluent Limitations:
   1) The BOD_5 limitation was updated to $CBOD_5$ since the permit limits TKN.

c) Other:
   1) The river mile was corrected from 0.76 to 0.42.

23. Variances/Alternate Limits or Conditions:

None

24. Public Notice Information:

First Public Notice Date: 5/4/12 Second Public Notice Date: 5/11/12

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3834, Alison.Thompson@deq.virginia.gov. See Attachment 9 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

25. 303 (d) Listed Stream Segments and Total Max. Daily Loads (TMDL):

The receiving stream is not included in the 2010 Integrated Report. There are two downstream impairments on the Rappahannock River, the receiving stream is not included:

Recreation Use (*E. coli*) – Impairment begins approximately 13.7 miles downstream of Outfall 001 in the tidal freshwater Rappahannock; Sufficient excursions from the maximum *E. coli* bacteria criterion (11 of 42 samples - 26.2%) were recorded at DEQ's ambient water quality monitoring station (3-RPP110.57) at the Route 1 crossing, and at Station 107.91 (4 of 31 samples (12.9%) to assess this stream segment as not supporting of the recreation use goal for the 2010 water quality assessment. The Bacteria TMDL was approved on May 5, 2008. Hartwood Elementary was not assigned a WLA in the tidal freshwater Rappahannock Bacteria TMDL.

Fish Consumption Use (PCBs in Fish Tissue) - Impairment begins approximately 13.7 miles downstream of Outfall 001; The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. The advisory, dated 12/13/04, limits American eel, blue catfish, carp, channel catfish, croaker, gizzard shad, and anadromous (coastal) striped bass consumption to no more than two meals per month. The affected area extends from the I-95 Bridge above Fredericksburg downstream to the mouth of the river near Stingray Point, including its tributaries Hazel Run up to the I-95 Bridge crossing and Claiborne Run up to the Route 1 Bridge crossing. In addition, excursions above the water quality criterion based tissue value (TV) of 20 parts per billion (ppb) for polychlorinated biphenyls (PCBs) in fish tissue were recorded in four species of fish (7 total samples) collected in 2006 at monitoring station 3-RPP107.33 (blueback herring, blue catfish, gizzard shad, striped bass). As a result, the waters were assessed as not supporting the fish consumption use goal. The TMDL is expected in 2016.

26. Additional Comments:

Previous Board Action(s): There have been no recent Board actions.

Staff Comments: None.

Public Comment: None.

EPA Checklist: The checklist can be found in Attachment 10.

Attachments to the Hartwood Elementary School (VA0060348) Fact Sheet

Attachment 1	Flow Frequency Determination
Attachment 2	Facility Schematic
Attachment 3	Topographic Map
Attachment 4	Site Inspection Memorandum
Attachment 5	Planning Statement
Attachment 6	Water Quality Criteria and Wasteload Allocation Calculations and pH/Temp data
Attachment 7	Statistical Evaluations for Effluent Limitations
Attachment 8	Dissolved Oxygen Modeling
Attachment 9	Public Notice
Attachment 10	EPA Checklist

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Water Quality Assessments and Planning
629 E. Main Street P.O. Box 10009 Richmond, Virginia 23240

SUBJECT: Flow Frequency Determination
Hartwood Elementary School - #VA0060348

TO: James Olson, NRO

FROM: Paul Herman, WQAP

DATE: January 21, 1997

COPIES: Ron Gregory, Charles Martin, File

The Hartwood Elementary School discharges to an unnamed tributary to Horsepen Run near Hartwood, VA. Stream flow frequencies are required at this site by the permit writer for the purpose of calculating effluent limitations for the VPDES permit.

At the discharge point, the receiving stream is shown as a dry ravine on the USGS Storck Quadrangle topographic map. The flow frequencies for a dry ravine are 0.0 cfs for the 1Q10, 7Q10, 30Q5, high flow 1Q10, high flow 7Q10, and harmonic mean. For modeling purposes, flow frequencies have benn determined for the first perennial segment of Horsepen Run.

The USGS conducted several flow measurements on the Deep Run in 1963 and from 1981 to 1984. The measurements were made at the Route 615 bridge near the Goldvein, VA. The measurements made by the USGS correlated very well with the same day daily mean values from two continuous record gages; one on the Cedar Run near Catlett, VA #01656000 and the other on the Aquia Creek near Garrisonville, VA #01660400. The measurements and daily mean values were plotted by the USGS on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gages were plotted on the regression line and the associated flow frequencies at the measurement site were determined from the graph. An average of the two flow values was then taken.

The flow frequencies at the discharge point were determined by using the values at the measurement site and adjusting them by proportional drainage areas. The data for the reference gage, the measurement site and the discharge point are presented below:

Cedar Run near Catlett, VA (#01656000):

Drainage Area = 93.4 mi^2

1Q10 = 0.0 cfs	High Flow 1Q10 = 5.0 cfs
7Q10 = 0.0 cfs	High Flow 7Q10 = 6.7 cfs
30Q5 = 0.13 cfs	HM = 0.0 cfs

Aquia Creek near Garrisonville, VA (#01660400):

Drainage Area = 34.9 mi^2

1Q10 = 0.0 cfs	High Flow 1Q10 = 3.9 cfs
7Q10 = 0.03 cfs	High Flow 7Q10 = 4.8 cfs
30Q5 = 0.28 cfs	HM = 0.0 cfs

Deep Run at Rt. 615 near Goldvein, VA (#01665220):

Drainage Area = 15.4 mi^2

1Q10 = 0.0 cfs	High Flow 1Q10 = 1.2 cfs
7Q10 = 0.0 cfs	High Flow 7Q10 = 1.5 cfs
30Q5 = 0.13 cfs	HM = 0.0 cfs

Horsepen Run above unnamed tributary:

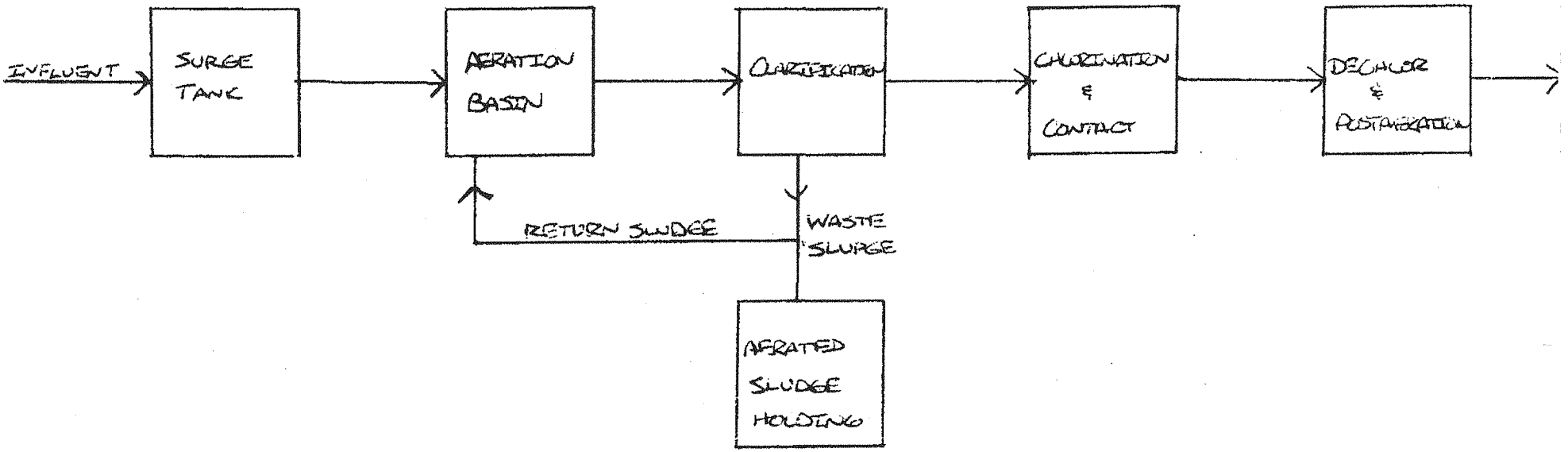
Drainage Area = 1.20 mi^2

1Q10 = 0.0 cfs	High Flow 1Q10 = 0.09 cfs
7Q10 = 0.0 cfs	High Flow 7Q10 = 0.12 cfs
30Q5 = 0.01 cfs	HM = 0.0 cfs

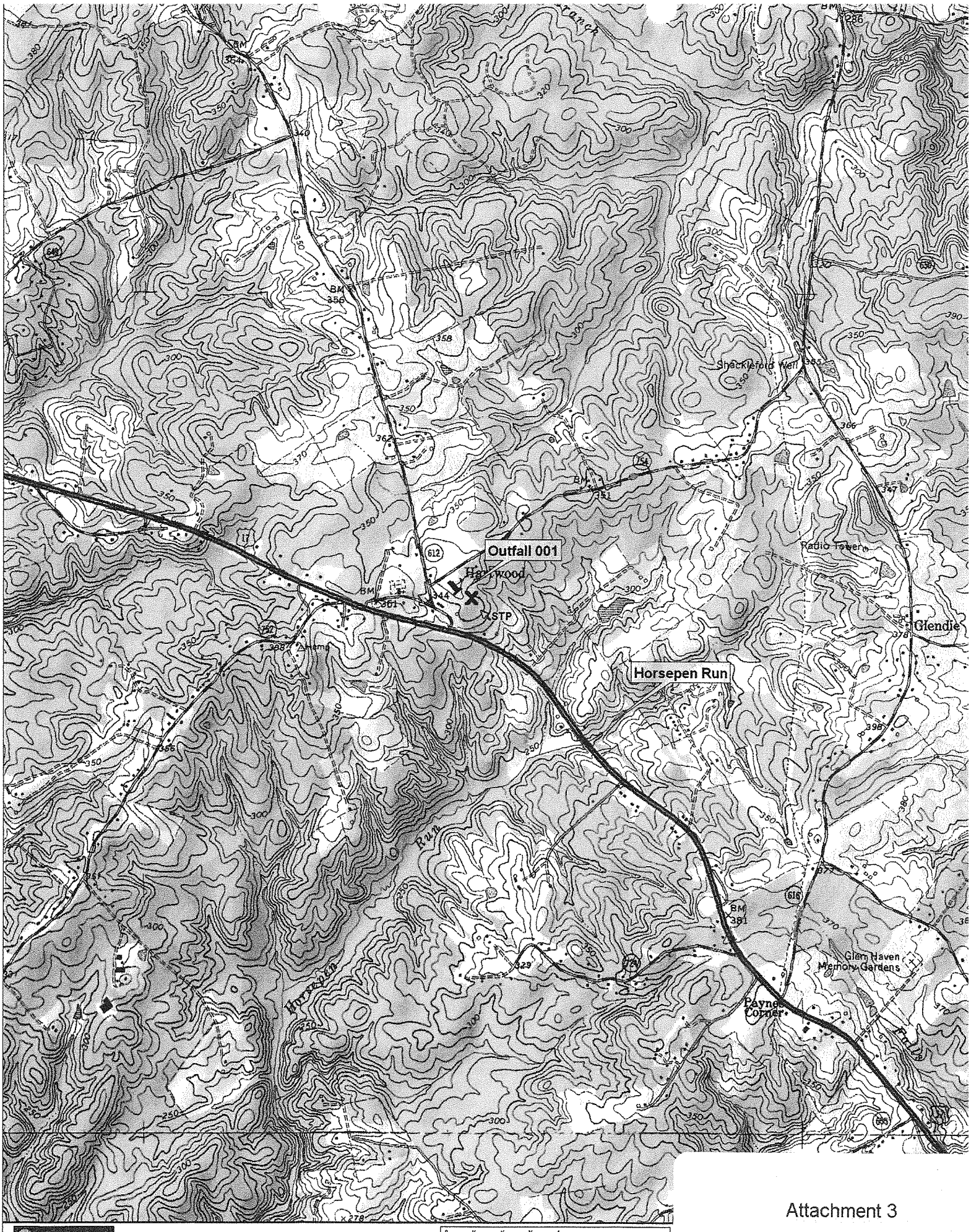
The high flow months are December through April.

This analysis assumes there are no significant discharges, withdrawals or springs influencing the flow in the Horsepen Run upstream of the discharge point.

If there are any questions concerning this analysis, please let me know.



Attachment 2



Attachment 3

February 14, 2012

MEMORANDUM

TO: Hartwood Elementary School WWTP Permit File (VA0060348)

FROM: Alison Thompson

SUBJECT: Permit Reissuance Site Inspection

The purpose of this memo is to document the conditions at the Hartwood Elementary School Wastewater Treatment Plant and receiving stream (Horsepen Run, UT) observed during the site inspection conducted on February 13, 2012. Tim Jenkins of Dabney & Crooks, the contract operator for Hartwood Elementary School WWTP, was present at the inspection.

The treatment works consists of two 5,000-gallon septic tanks, one for the cafeteria and one for the remainder of the school, followed by a package plant with a design capacity of 0.0078 million gallons per day (MGD). Wastewater from the septic tanks flows to an aerated surge tank, followed by two aeration basins in series, a clarifier, tablet chlorination and contact tank, tablet dechlorination with sodium bisulfate, and post-aeration. Soda ash is added as needed to augment the pH which tends to be low when the plant is nitrifying; approximately 2 cups of soda ash is added to the splitter box once or twice a week. On school days, the blower for the aeration basins operates 30 minutes on/30 minutes off. On weekends and school breaks, the timing is 15 minutes on/45 minutes off. The settled sludge from the clarifier is returned to the aeration basin or wasted to the aerated sludge holding tank. The decant water from the sludge holding tank is returned to the surge basin.

There is a high level alarm in the surge basin. When the level gets too high, a red flashing light is activated. School officials then contact the operator who will respond to correct the problem. The plant is designed so that if the level of the surge basin tops the basin, it will overflow into the sludge holding tank and then into the first aeration basin.

Soda Ash, Sodium Hypochlorite, and Sodium Bisulfite are ordered at the beginning of the school year and are stored in a locked shed located close to the WWTP.

Waste sludge is hauled away by a tank truck to the Little Falls Run Wastewater Treatment Plant for processing and disposal at the end of the school year. At the same time, the septic tanks and the plant are also pumped out by a licensed septic hauler.

The final effluent discharges via cascade step aeration to a drainage ditch, which is an unnamed tributary (UT) to Horsepen Run. The flow observed on February 13, 2012, was clear and free from solids. The discharge, once it reaches the bottom of the steps, appears to go underground, resurfacing on the far stream bank of the UT to Horsepen Run. Staff observed that the receiving stream flow disappeared and reappeared several times downstream from the outfall. The flow in the UT approximately 100 feet from the outfall was clear. The streambed is sandy with large rocks interspersed. There was standing water upstream of the discharge in the UT.

To: Alison Thompson
From: Jennifer Carlson

Date: February 2, 2012
Subject: Planning Statement for Hartwood Elementary School
Permit No: VA0060348

Discharge Type: Municipal
Discharge Flow: 0.0078 mgd

Receiving Stream: Horsepen Run, UT
Stream Code: 3-XDY
Rivermile: 0.42
Latitude/Longitude: 38.24.08 77.33.45
Waterbody: VAN-E19R
Water Quality Stds: Class III, Section 4d

1. Is there monitoring data for the receiving stream?

   There is not any monitoring data for the UT to Horsepen Run.

   - If yes, please attach latest summary.
   - If no, where is the nearest downstream monitoring station.

   The nearest downstream DEQ monitoring station is 3-RPP113.37, located at the USGS cableway on the Rappahannock River, approximately 11.0 miles downstream of Outfall 001. The following is the summary for the segment of the Rappahannock River where station 3-RPP113.37 is located, as taken from the 2010 Integrated Report:

   Class III, Section 4b, special stds. PWS.

   USGS monitoring station 1668000. DEQ ambient monitoring station 3-RPP113.37, at the USGS cableway.

   The aquatic life, public water supply, and wildlife uses are considered fully supporting. The fish consumption and recreation uses were not assessed.

2. Is the receiving stream on the current 303(d) list?

   No. The UT to Horsepen Run is not on the current 303(d) list.

- If yes, what is the impairment? N/A

- Has the TMDL been prepared? N/A

- If yes, what is the WLA for the discharge? N/A

- If no, what is the schedule for the TMDL? N/A

3. If the answer to (2) above is no, is there a downstream 303(d) listed impairment?

Yes, the tidal Rappahannock River is listed with several impairments.

- If yes, what is the impairment?

Recreation Use (*E. coli*) – Impairment begins approximately 13.7 miles downstream of Outfall 001; Sufficient excursions from the maximum E. coli bacteria criterion (11 of 42 samples - 26.2%) were recorded at DEQ's ambient water quality monitoring station (3-RPP110.57) at the Route 1 crossing, and at Station 107.91 (4 of 31 samples (12.9%) to assess this stream segment as not supporting of the recreation use goal for the 2010 water quality assessment.

Fish Consumption Use (PCBs in Fish Tissue) - Impairment begins approximately 13.7 miles downstream of Outfall 001; The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. The advisory, dated 12/13/04, limits American eel, blue catfish, carp, channel catfish, croaker, gizzard shad, and anadromous (coastal) striped bass consumption to no more than two meals per month. The affected area extends from the I-95 bridge above Fredericksburg downstream to the mouth of the river near Stingray Point, including its tributaries Hazel Run up to the I-95 bridge crossing and Claiborne Run up to the Route 1 bridge crossing. In addition, excursions above the water quality criterion based tissue value (TV) of 20 parts per billion (ppb) for polychlorinated biphenyls (PCBs) in fish tissue were recorded in four species of fish (7 total samples) collected in 2006 at monitoring station 3-RPP107.33 (blueback herring, blue catfish, gizzard shad, striped bass). As a result, the waters were assessed as not supporting the fish consumption use goal.

- Has a TMDL been prepared?

Bacteria TMDL – Yes
PCB TMDL - No

- Will the TMDL include the receiving stream?

The UT to Horsepen Run will not be specifically included in the TMDL, but upstream facilities are taken into account during TMDL development.

- Is there a WLA for the discharge?

A WLA has not been assigned to this facility.

- What is the schedule for the TMDL?

The Bacteria TMDL was completed and approved by EPA on 5/5/2008.
The PCB TMDL is due by 2016.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

In support for the PCB TMDL that will be developed for the tidal Rappahannock River by 2016, this facility is a candidate for low-level PCB monitoring, based upon its designation as a minor municipal facility. Low-level PCB analysis uses EPA Method 1668B, which is capable of detecting low-level concentrations for all 209 PCB congeners. The Assessment/TMDL Staff has concluded that low-level PCB monitoring is not warranted for this facility, as it has an intermittent, seasonal discharge of less than 0.1 MGD. Based upon this information, this facility will not be requested to monitor for low-level PCBs.

There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

5. Fact Sheet Requirements – Please provide information on other VPDES permits or VADEQ monitoring stations located within a 2 mile radius of the facility. In addition, please provide information on any drinking water intakes located within a 5 mile radius of the facility.

The PWS intake for Abel Lake WTP is located within a 5 mile radius. However, this intake is located in waterbody VAN-A29R, in the Potomac River watershed.

There are no other VPDES permits or DEQ monitoring stations within a 2 mile radius of this facility.

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Hartwood Elementary School Permit No.: VA0060348

Receiving Stream: Horsepen Run, UT Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information			Stream Flows			Mixing Information			Effluent Information		
Mean Hardness (as CaCO3) =		mg/L	1Q10 (Annual) =	0	MGD	Annual - 1Q10 Mix =	100	%	Mean Hardness (as CaCO3) =	73	mg/L
90% Temperature (Annual) =		deg C	7Q10 (Annual) =	0	MGD	- 7Q10 Mix =	100	%	90% Temp (Annual) =	23	deg C
90% Temperature (Wet season) =		deg C	30Q10 (Annual) =	0	MGD	- 30Q10 Mix =	100	%	90% Temp (Wet season) =	20	deg C
90% Maximum pH =		SU	1Q10 (Wet season) =	0	MGD	Wet Season - 1Q10 Mix =	100	%	90% Maximum pH =	7.4	SU
10% Maximum pH =		SU	30Q10 (Wet season)	0	MGD	- 30Q10 Mix =	100	%	10% Maximum pH =		SU
Tier Designation (1 or 2) =	1		30Q5 =	0	MGD				Discharge Flow =	0.0078	MGD
Public Water Supply (PWS) Y/N? =	n		Harmonic Mean =	0	MGD						
Trout Present Y/N? =	n										
Early Life Stages Present Y/N? =	y										

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	9.9E+0
Acrolein	0	--	--	na	9.3E+00	--	--	na	9.3E+00	--	--	--	--	--	--	--	--	--	--	na	9.3E+0
Acrylonitrile [C]	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+0
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	3.0E+00	--	na	5.0E-0
Ammonia-N (mg/l) (Yearly)	0	2.30E+01	2.74E+00	na	--	2.30E+01	2.74E+00	na	--	--	--	--	--	--	--	--	--	2.30E+01	2.74E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	2.30E+01	3.32E+00	na	--	2.30E+01	3.32E+00	na	--	--	--	--	--	--	--	--	--	2.30E+01	3.32E+00	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.0E+04	--	--	--	--	--	--	--	--	--	--	na	4.0E+0
Antimony	0	--	--	na	6.4E+02	--	--	na	6.4E+02	--	--	--	--	--	--	--	--	--	--	na	6.4E+0
Arsenic	o	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	5.1E+0
Benzidine [C]	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	2.0E-0
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+0
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+0
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	2.2E+0
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+0
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+0
Cadmium	0	2.8E+00	8.9E-01	na	--	2.8E+00	8.9E-01	na	--	--	--	--	--	--	--	--	--	2.8E+00	8.9E-01	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	1.6E+0
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.1E-03	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	8.1E-0
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+0

Attachment 6

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+0
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+0
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+0
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	8.3E-02	4.1E-02	na	--
Chromium III	0	4.4E+02	5.7E+01	na	--	4.4E+02	5.7E+01	na	--	--	--	--	--	--	--	--	--	4.4E+02	5.7E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Copper	0	1.0E+01	6.8E+00	na	--	1.0E+01	6.8E+00	na	--	--	--	--	--	--	--	--	--	1.0E+01	6.8E+00	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	--	--	--	--	--	--	--	--	2.2E+01	5.2E+00	na	1.6E+0
DDD [C]	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	--	--	na	3.1E-0
DDE [C]	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	--	--	na	2.2E-0
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	--	--	--	--	--	--	--	--	1.1E+00	1.0E-03	na	2.2E-0
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	--	--	--	--	--	--	--	--	1.7E-01	1.7E-01	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	--	--	na	1.3E+0
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	9.6E+02	--	--	--	--	--	--	--	--	--	--	na	9.6E+0
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	--	--	na	1.9E+0
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	--	--	na	2.8E-0
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+0
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	3.7E+0
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	7.1E+03	--	--	--	--	--	--	--	--	--	--	na	7.1E+0
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	--	--	na	1.0E+0
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.9E+02	--	--	--	--	--	--	--	--	--	--	na	2.9E+0
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	--	--	na	2.1E+0
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	--	--	--	--	--	--	--	--	2.4E-01	5.6E-02	na	5.4E-0
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	4.4E+04	--	--	--	--	--	--	--	--	--	--	na	4.4E+0
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	--	--	na	8.5E+0
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	--	--	na	1.1E+0
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	--	--	na	4.5E+0
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+0
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.8E+02	--	--	--	--	--	--	--	--	--	--	na	2.8E+0
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	--	--	na	3.4E+0
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.1E-08	--	--	--	--	--	--	--	--	--	--	na	5.1E-0
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	--	--	na	2.0E+0
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	8.9E+0
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	8.9E+0
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	8.9E+0
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	--	--	--	--	--	--	--	--	8.6E-02	3.6E-02	na	6.0E-0
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.0E-01	--	--	--	--	--	--	--	--	--	--	na	3.0E-0

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	2.1E+0
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	--	--	na	1.4E+0
Fluorene	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+0
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor [c]	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	7.9E-0
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	3.9E-0
Hexachlorobenzene[c]	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-0
Hexachlorobutadiene[c]	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+0
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-0
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-0
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	1.8E+00	--	--	--	--	--	--	--	--	9.5E-01	--	na	1.8E+0
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+0
Hexachloroethane[c]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+0
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[c]	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+0
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	8.0E+01	9.0E+00	na	--	8.0E+01	9.0E+00	na	--	--	--	--	--	--	--	--	--	8.0E+01	9.0E+00	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	- -	- -	1.4E+00	7.7E-01	- -	- -	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	- -	- -
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
Methylene Chloride [c]	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+0
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	1.4E+02	1.6E+01	na	4.6E+03	1.4E+02	1.6E+01	na	4.6E+03	--	--	--	--	--	--	--	--	1.4E+02	1.6E+01	na	4.6E+0
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.9E+02	--	--	--	--	--	--	--	--	--	--	na	6.9E+0
N-Nitrosodimethylamine[c]	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+0
N-Nitrosodiphenylamine[c]	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+0
N-Nitrosodi-n-propylamine[c]	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+0
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB Total[c]	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	--	--	--	--	--	--	--	--	1.4E-02	na	6.4E-0
Pentachlorophenol [c]	0	7.7E-03	5.9E-03	na	3.0E+01	7.7E-03	5.9E-03	na	3.0E+01	--	--	--	--	--	--	--	--	7.7E-03	5.9E-03	na	3.0E+0
Phenol	0	--	--	na	8.6E+05	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	--	--	na	8.6E+0
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+0
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.0E+00	--	--	--	--	--	--	--	--	--	--	na	4.0E+0
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.2E+03	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**na**	**4.2E+0**
Silver	0	2.0E+00	--	na	--	2.0E+00	--	na	--	--	--	--	--	--	--	--	--	**2.0E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+0**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+0**
Thallium	0	--	--	na	4.7E-01	--	--	na	4.7E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E-0**
Toluene	0	--	--	na	6.0E+03	--	--	na	6.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.0E+0**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	2.8E-03	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**na**	**2.8E-0**
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	--	--	--	--	**4.6E-01**	**7.2E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.0E+0**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+0**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.0E+0**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+0**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+0**
Zinc	0	9.0E+01	9.0E+01	na	2.6E+04	9.0E+01	9.0E+01	na	2.6E+04	--	--	--	--	--	--	--	--	**9.0E+01**	**9.0E+01**	**na**	**2.6E+0**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.4E+02
Arsenic	9.0E+01
Barium	na
Cadmium	5.3E-01
Chromium III	3.4E+01
Chromium VI	6.4E+00
Copper	4.0E+00
Iron	na
Lead	5.4E+00
Manganese	na
Mercury	4.6E-01
Nickel	9.3E+00
Selenium	3.0E+00
Silver	8.0E-01
Zinc	3.6E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Hartwood Elementary School pH and temperature values reported on the Discharge Monitoring Reports

Date	pH value (S.U.)	Temperature value (deg C)		
1/3/11	7.3	12		
1/4/11	6.9	9	90th percentile pH:	7.4
1/5/11	7.1	10	90th percentile temp:	23
1/6/11	7	10		
1/7/11	7.1	9		
1/10/11	7.2	10		
1/11/11	7.2	9		
1/13/11	7.4	10		
1/14/11	7.2	10		
1/19/11	7.1	11		
1/20/11	7.2	10		
1/21/11	7.1	10		
1/24/11	7.2	9		
1/25/11	7.1	11		
1/26/11	7.2	10		
1/28/11	7.1	8		
1/31/11	7.2	9		
2/1/11	7.4	9		
2/2/11	7.2	10		
2/3/11	7.1	11		
2/4/11	7.2	10		
2/7/11	7	10		
2/8/11	7.4	12		
2/9/11	7.3	10		
2/11/11	7.1	9		
2/14/11	7.4	10		
2/15/11	7.6	11		
2/16/11	7.4	11		
2/17/11	7.3	13		
2/18/11	7.4	14		
2/21/11	7.3	13		
2/22/11	7.2	14		
2/23/11	7.2	14		
2/24/11	7.2	13		
2/25/11	7.3	13		
2/28/11	7.2	14		
3/1/11	7.2	13		
3/2/11	7.2	11		
3/3/11	7.3	12		
3/4/11	7.3	12		
3/7/11	7.2	12		
3/8/11	7.1	13		
3/9/11	7.4	13		

3/10/11	7.2	14
3/11/11	7.3	13
3/14/11	7.5	13
3/15/11	7.5	13
3/16/11	7.4	14
3/17/11	7.4	14
3/18/11	7.4	14
3/21/11	7.5	14
3/22/11	7.3	14
3/23/11	7.5	14
3/24/11	7.4	13
3/25/11	7.3	14
3/28/11	7.3	13
3/29/11	7.5	14
3/30/11	7.4	13
3/31/11	7.2	13
4/1/11	7.2	13
4/4/11	7.1	13
4/5/11	7.2	15
4/6/11	7.1	16
4/7/11	7	15
4/8/11	7.3	16
4/11/11	7.2	17
4/12/11	7.7	17
4/13/11	7.4	18
4/14/11	7.5	17
4/15/11	7.4	17
4/18/11	7.2	19
4/19/11	7.1	19
4/20/11	7.3	19
4/21/11	7.1	18
4/22/11	7.2	19
5/2/11	7.1	20
5/3/11	7	19
5/4/11	7.3	18
5/5/11	7.2	19
5/6/11	7.3	19
5/9/11	7.1	20
5/10/11	7.3	19
5/11/11	7.2	20
5/12/11	7.2	20
5/13/11	7.1	20
5/16/11	7.3	21
5/17/11	7.2	17
5/18/11	7.2	19
5/19/11	7.3	21
5/20/11	7.3	20

5/23/11	7.3	19
5/24/11	7	21
5/25/11	7.2	21
5/26/11	7	22
5/27/11	7.1	22
5/31/11	7.3	24
6/1/11	7.2	25
6/2/11	7.5	24
6/3/11	7.2	24
6/6/11	6.5	25
6/7/11	6.8	25
6/8/11	6.7	24
6/9/11	6.8	25
6/10/11	6.8	25
6/13/11	6.6	26
6/14/11	6.9	23
6/15/11	6.4	23
6/16/11	6.5	23
6/17/11	6.6	23
6/20/11	6.7	22
6/21/11	6.8	23
6/28/11	6.9	24
9/6/11	7.8	22
9/7/11	7.6	21
9/8/11	7.6	22
9/9/11	7.5	21
9/12/11	7.6	20
9/13/11	7.2	24
9/14/11	7	24
9/15/11	6.8	23
9/16/11	7.2	23
9/19/11	7.1	22
9/20/11	6.9	22
9/21/11	6.4	23
9/22/11	6.8	23
9/23/11	6.7	23
9/26/11	7	22
9/27/11	7.1	23
9/28/11	7.2	22
9/29/11	7	24
9/30/11	7	22
10/3/11	6.9	24
10/4/11	6.7	21
10/5/11	6.8	24
10/6/11	7.1	24
10/7/11	7	22
10/11/11	6.2	21

10/12/11	6.1	21
10/13/11	6.4	20
10/14/11	6.2	21
10/17/11	6	20
10/18/11	6.8	20
10/19/11	6.6	19
10/20/11	6.9	19
10/21/11	6.6	18
10/24/11	6.4	18
10/25/11	6.8	19
10/26/11	6.6	18
10/27/11	6.8	19
10/28/11	6.8	18
10/31/11	6.5	17
11/1/11	6.6	17
11/2/11	6.8	17
11/3/11	6.8	17
11/4/11	6.7	16
11/7/11	6.8	17
11/8/11	6.9	15
11/9/11	6.6	16
11/10/11	6.8	16
11/14/11	6.6	17
11/15/11	7	16
11/16/11	6.2	16
11/17/11	6.8	17
11/18/11	6.5	15
11/21/11	7.6	16
11/22/11	7.5	16
11/25/11	7.5	16
11/28/11	6.2	16
11/29/11	7	16
11/30/11	6.7	15
12/1/11	6.4	16
12/2/11	6.6	14
12/5/11	6.6	15
12/6/11	6.8	16
12/7/11	6.7	15
12/8/11	6.9	16
12/9/11	6.7	14
12/12/11	6.8	12
12/13/11	6.8	13
12/14/11	6.8	13
12/15/11	6.9	15
12/16/11	6.8	13
12/19/11	6.7	14
12/20/11	7.1	13

12/21/11	6.9	13
12/23/11	6.8	13

Facility = Hartwood Elementary School
Chemical = Chlorine
Chronic averaging period = 30
WLAa = 0.019
WLAc =
Q.L. = 0.1
# samples/mo. = 30
# samples/wk. = 7

Summary of Statistics:

observations = 1
Expected Value = 1
Variance = .36
C.V. = 0.6
97th percentile daily values = 2.43341
97th percentile 4 day average = 1.66379
97th percentile 30 day average= 1.20605
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 0.019
Average Weekly limit = 1.16034369282885E-02
Average Monthly Limit = 9.4168021134859E-03

The data are:

1

MEMORANDUM

Burt
Rec. 2/17/88
Due 2/29/88
Martin Ferguson OWRM.

VIRGINIA WATER CONTROL BOARD
NORTHERN REGIONAL OFFICE

5515 Cherokee Avenue, Suite 404 Alexandria, Virginia 22312

SUBJECT: Hartwood Elementary School Wastewater Treatment Plant, NPDES Permit No. VA0060348, Stream Model

TO: Martin Ferguson, OWRM

FROM: Joan C. Foundos

DATE: February 12, 1988

COPIES: Burt Tuxford, OWRM

By permit application received January 22, 1988, we have been requested to modify the Hartwood Elementary School WWTP's NPDES permit to reflect an increase in design flow from 0.0042 MGD to 0.005 MGD. This facility discharges into an unnamed tributary to Horsepen Run (topo attached).

A previous stream model (attached) was performed using a design flow of 0.0021 MGD. The same assumptions and drainage areas used in the previous model were assumed in my model with the following exceptions:

1. The K_2 rates in the first and second sections were changed. When determining the K_2 rates for the previous model, the following chart was referred to:

K_a = Reaeration Coefficient
Typical Values @ 20°C

Description	K_a (day^{-1})
Well-aerated, shallow stream	1.0-3.0
Small streams and rivers	0.5-1.0
Large rivers	0.2-0.5
Lakes and Estuaries	0.1-0.15

The previous modeler classified these sections as "small streams and rivers" thereby assigning a K_2 rate of 0.5. On February 4, 1988, a site inspection of the stream was made. The first section was walked and the second section was observed at two locations. It is my opinion that these two sections should have been classified as "well-aerated, shallow stream" thereby resulting in a K_2 rate of 3.0. A K_2 rate of 3.0 was used for the first two sections of my model.

2. During a follow-up site inspection on February 9, 1988, the velocities were measured for section one and two. Based on these measurements, the velocities were changed as follows:

	previous velocity	new velocity
Section 1	0.3 ft/sec	0.75 ft/sec
Section 2	0.3 ft/sec	0.6 ft/sec

3. The previous model's 3rd section used only the flow above the confluence of the unnamed tributary and Horsepen Run and did not consider any flow drainage from the numerous tributaries in this 3.4 mile stretch. For my model, the 3rd section length was 1.3 miles and included the additional drainage area. The 4th section length was 0.37 miles long and also included the drainage area.

Attached are the following 4 stream models:

1. **Model 1** uses the design flow of 0.0021 MGD and is run based on my assumptions.

2. **Model 2** uses the design flow of 0.005 MGD and shows that the stream recovers in the 4th section, 2.37 miles downstream. The Δ DO = 0.19 which is acceptable.

3. **Model 3** is the sensitivity run in which the K_1 rate was doubled. Although the model does not show that the stream has recovered, the drop in Dissolved Oxygen was minimal in the last two sections. If the run was extended to include the next drainage area, I feel that the stream would show a recovery. The Δ DO = 0.62 mg/l occurred in the 3rd section and this is acceptable.

4. **Model 4** is the sensitivity run in which the K_2 is halved. Again, this run does not show the stream recovering; however, the drop in DO is minimal in the last two sections. The Δ DO = 0.42 mg/l occurred in the 3rd section and this is acceptable. Recovery is assured in the next stretch when the additional drainage area is considered.

Based on the above models, the following effluent limits are established for the Hartwood Elementary School WWTP:

Design flow	0.005 MGD
BOD_5	24 mg/l
DO	6.5 mg/l

Should you have any questions, please call. THANKS, BURT, FOR ALL YOUR HELP!!!!!

MODEL SIMULATI[illegible] THE HARTWOOD ELEMENTARY SCHOOL WASTEWATER [illegible] PLANT
DISCHARGE TO [illegible] UTARY TO HORSEPEN RUN

Model 1

==========

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.30 MILE FROM THE BEGINNING OF A SEGMENT

****

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 0.40 MI VELOCITY = 12.273 MI/D
TEMP. = 30.0 °C ELEV = 310.00 FT SATURATION D.O. = 7.636 MG/L
Ka = 3.000 /DAY Kr = 0.200 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0021 MGD D.O.= 6.00 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.000	31.200	0.000
0.300	0.300	5.916	30.959	0.000
0.400	0.400	5.890	30.880	0.000

****

THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 0.30 MI VELOCITY = 9.818 MI/D
TEMP. = 30.0 °C ELEV = 255.00 FT SATURATION D.O. = 7.651 MG/L
Ka = 3.000 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0046 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.400	6.574	11.738	0.000
0.300	0.700	6.612	11.654	0.000

SEGMENT LENGTH = [illegible]0 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 °C [illegible] = 235.00 FT SATURATION D.O. = 7.657 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0147 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 3 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.700	6.803	5.709	0.000
0.300	1.000	6.819	5.627	0.000
0.600	1.300	6.835	5.546	0.000
0.900	1.600	6.849	5.466	0.000
1.200	1.900	6.864	5.387	0.000
1.300	2.000	6.868	5.361	0.000

****

THE VARIABLES FOR SECTION 4 ARE:

SEGMENT LENGTH = 0.37 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 °C ELEV = 217.00 FT SATURATION D.O. = 7.661 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0282 MGD D.O.= 6.90 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 4 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	2.000	6.884	4.019	0.000
0.300	2.300	6.914	3.961	0.000
0.370	2.370	6.921	3.948	0.000

****

SIMULATION COMPLETED

Model 1 & 2

MODEL SIMULATION FOR THE HARTWOOD ELEMENTARY SCHOOL WASTEWATER TREATMENT PLANT
DISCHARGE TO UNNAMED TRIBUTARY TO HORSEPEN RUN

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.30 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 0.40 MI VELOCITY = 12.273 MI/D
TEMP. = 30.0 °C ELEV = 310.00 FT SATURATION D.O. = 7.636 MG/L
Ka = 3.000 /DAY Kr = 0.200 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0050 MGD D.O.= 6.50 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.500	31.200	0.000
0.300	0.300	6.371	30.959	0.000
0.400	0.400	6.331	30.880	0.000

THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 0.30 MI VELOCITY = 9.818 MI/D
TEMP. = 30.0 °C ELEV = 255.00 FT SATURATION D.O. = 7.651 MG/L
Ka = 3.000 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0046 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.400	6.597	17.521	0.000
0.300	0.700	6.593	17.304	0.000

********** **********

THE VARIABLES FOR ON 3 ARE:

SEGMENT LENGTH = 1.30 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 °C ELEV = 235.00 FT SATURATION D.O. = 7.657 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0147 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 3 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.700	6.773	8.687	0.000
0.300	1.000	6.752	8.561	0.000
0.600	1.300	6.735	8.438	0.000
0.900	1.600	6.721	8.317	0.000
1.200	1.900	6.711	8.197	0.000
1.300	2.000	6.708	8.157	0.000

****

THE VARIABLES FOR SECTION 4 ARE:

SEGMENT LENGTH = 0.37 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 °C ELEV = 217.00 FT SATURATION D.O. = 7.661 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0282 MGD D.O.= 6.90 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 4 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	2.000	6.809	5.387	0.000
0.300	2.300	6.829	5.309	0.000
0.370	2.370	6.833	5.291	0.000

SIMULATION COMPLE

02-10-1988 14:53:40

Model 3

MODEL SIMULATION - THE HAWKWOOD ELEMENTARY SCHOOL WASTEWATER TREATMENT PLANT
DISCHARGE TO UNNAMED TRIBUTARY TO HORSEPEN RUN

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.30 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 0.40 MI VELOCITY = 12.273 MI/D
TEMP. = 30.0 °C ELEV = 310.00 FT SATURATION D.O. = 7.636 MG/L
Ka = 3.000 /DAY Kr = 0.400 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0050 MGD D.O.= 6.50 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.500	31.200	0.000
0.300	0.300	6.143	30.721	0.000
0.400	0.400	6.033	30.563	0.000

THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 0.30 MI VELOCITY = 9.818 MI/D
TEMP. = 30.0 °C ELEV = 255.00 FT SATURATION D.O. = 7.651 MG/L
Ka = 3.000 /DAY Kr = 0.300 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0046 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.400	6.442	17.356	0.000
0.300	0.700	6.338	17.106	0.000

SEGMENT LENGTH = [illegible]MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 °C ELEV = 235.00 FT SATURATION D.O. = 7.657 MG/L
Ka = 1.500 /DAY Kr = 0.300 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0147 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 3 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.700	6.673	8.573	0.000
0.300	1.000	6.549	8.327	0.000
0.600	1.300	6.446	8.089	0.000
0.900	1.600	6.360	7.858	0.000
1.200	1.900	6.290	7.633	0.000
1.300	2.000	6.270	7.560	0.000

****

THE VARIABLES FOR SECTION 4 ARE:

SEGMENT LENGTH = 0.37 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 °C ELEV = 217.00 FT SATURATION D.O. = 7.661 MG/L
Ka = 1.500 /DAY Kr = 0.300 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0282 MGD D.O.= 6.90 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 4 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	2.000	6.606	5.110	0.000
0.300	2.300	6.584	4.964	0.000
0.370	2.370	6.580	4.931	0.000

****

MODEL SIMULATION [illegible] RTWOOD ELEMENTARY SCHOOL WASTEWATER TR[illegible] PLANT
DISCHARGE TO UNNAMED TRIBUTARY TO HORSEPEN RUN

Model 4

==========

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.30 MILE FROM THE BEGINNING OF A SEGMENT

****

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 0.40 MI VELOCITY = 12.273 MI/D
TEMP. = 30.0 °C ELEV = 310.00 FT SATURATION D.O. = 7.636 MG/L
Ka = 1.500 /DAY Kr = 0.200 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0050 MGD D.O.= 6.50 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.500	31.200	0.000
0.300	0.300	6.317	30.959	0.000
0.400	0.400	6.258	30.880	0.000

****

THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 0.30 MI VELOCITY = 9.818 MI/D
TEMP. = 30.0 °C ELEV = 255.00 FT SATURATION D.O. = 7.651 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0046 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.400	6.559	17.521	0.000
0.300	0.700	6.497	17.394	0.000

THE VARIABLES FOR 3 ARE:

SEGMENT LENGTH = 1.30 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 °C ELEV = 235.00 FT SATURATION D.O. = 7.657 MG/L
Ka = 0.750 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0147 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 3 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.700	6.735	8.687	0.000
0.300	1.000	6.666	8.561	0.000
0.600	1.300	6.602	8.438	0.000
0.900	1.600	6.543	8.317	0.000
1.200	1.900	6.490	8.197	0.000
1.300	2.000	6.473	8.157	0.000

THE VARIABLES FOR SECTION 4 ARE:

SEGMENT LENGTH = 0.37 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 °C ELEV = 217.00 FT SATURATION D.O. = 7.661 MG/L
Ka = 0.750 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

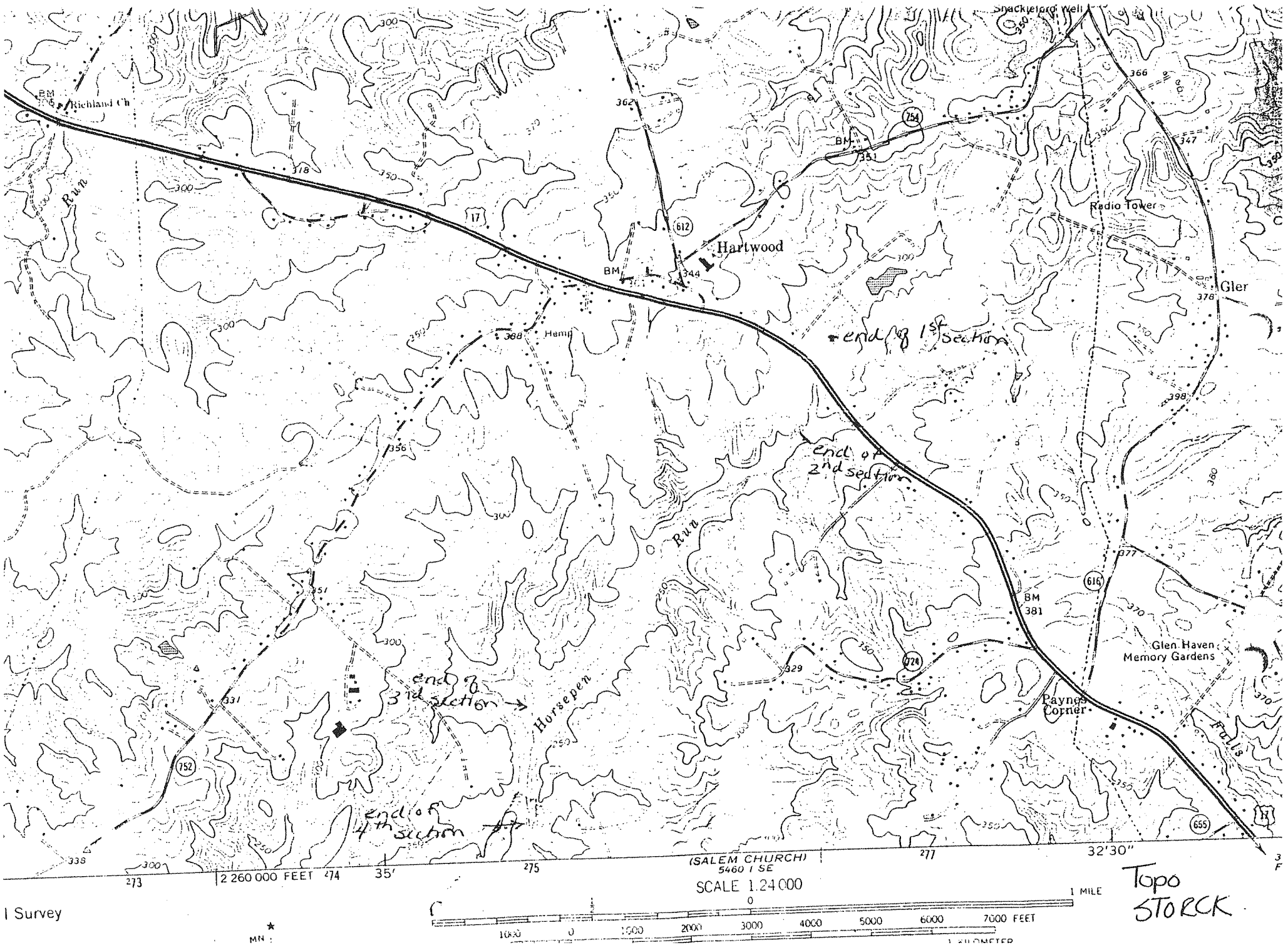
The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0282 MGD D.O.= 6.90 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 4 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	2.000	6.700	5.387	0.000
0.300	2.300	6.679	5.309	0.000
0.370	2.370	6.674	5.291	0.000


Richland Ch
Run
Hartwood
Hemp
Radio Tower
Gler
end of 1st section
end of 2nd section
Run
end of 3rd section
Horsepen
end of 4th section
Glen Haven Memory Gardens
Payne's Corner
Falls
BM 381
(SALEM CHURCH)
5460 I SE
SCALE 1:24 000
1 MILE
7000 FEET
2 260 000 FEET
35'
32'30"
Topo
STORCK
I Survey

MODEL SIMULATION FOR THE HARTWOOD SCHOOL (STAFFORD CO) DISCHARGE TO TRIB TO HORSEPEN RUN

Original Model

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.10 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 0.40 MI VELOCITY = 4.909 MI/D
TEMP. = 28.5 ½C ELEV = 360.00 FT SATURATION D.O. = 7.794 MG/L
Ka = 0.500 /DAY Kr = 0.200 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0021 MGD D.O.= 6.00 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.000	31.200	0.000
0.100	0.100	5.836	31.013	0.000
0.200	0.200	5.675	30.827	0.000
0.300	0.300	5.518	30.642	0.000
0.400	0.400	5.363	30.458	0.000

THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 0.30 MI VELOCITY = 4.909 MI/D
TEMP. = 28.5 ½C ELEV = 256.00 FT SATURATION D.O. = 7.822 MG/L
Ka = 0.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0046 MGD D.O.= 6.00 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF	TOTAL DISTANCE (MI) FROM	D.O.	CBODu	NBODu

SEGMENT	BEGINNING	(mg/l)	(mg/l)	(mg/l)
0.000	0.400	5.800	11.606	0.000
0.100	0.500	5.773	11.554	0.000
0.200	0.600	5.747	11.502	0.000
0.300	0.700	5.721	11.450	0.000

****

THE VARIABLES FOR SECTION 3 ARE:

SEGMENT LENGTH = 1.30 MI VELOCITY = 4.909 MI/D
TEMP. = 28.5 ½C ELEV = 245.00 FT SATURATION D.O. = 7.825 MG/L
Ka = 0.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0147 MGD D.O.= 6.00 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 3 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.700	5.914	5.646	0.000
0.100	0.800	5.912	5.620	0.000
0.200	0.900	5.911	5.595	0.000
0.300	1.000	5.910	5.570	0.000
0.400	1.100	5.908	5.545	0.000
0.500	1.200	5.907	5.520	0.000
0.600	1.300	5.906	5.495	0.000
0.700	1.400	5.906	5.470	0.000
0.800	1.500	5.905	5.445	0.000
0.900	1.600	5.904	5.421	0.000
1.000	1.700	5.904	5.396	0.000
1.100	1.800	5.903	5.372	0.000
1.200	1.900	5.903	5.348	0.000

1.300	2.000	5.903	5.92-	0.000

****

THE VARIABLES FOR SECTION 4 ARE:

SEGMENT LENGTH = 0.37 MI VELOCITY = 4.909 MI/D
TEMP. = 28.5 ½C ELEV = 217.00 FT SATURATION D.O. = 7.833 MG/L
Ka = 0.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0282 MGD D.O.= 6.01 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 4 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	2.000	5.963	4.003	0.000
0.100	2.100	5.968	3.985	0.000
0.200	2.200	5.973	3.967	0.000
0.300	2.300	5.978	3.949	0.000
0.370	2.370	5.982	3.936	0.000

****

SIMULATION COMPLETED

02-10-1988 11:05:01

MODEL SIMULATION FOR THE HAWTWOOD SCHOOL (STAFFORD CO) DISCHARGE TO TRIB TO HORSEPEN RUN

Permit Limit K

Model as after fa

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.10 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 0.40 MI VELOCITY = 12.273 MI/D
TEMP. = 30.0 ½C ELEV = 360.00 FT SATURATION D.O. = 7.623 MG/L
Ka = 3.000 /DAY Kr = 0.200 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0021 MGD D.O.= 6.00 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.000	31.200	0.000
0.100	0.100	5.970	31.120	0.000
0.200	0.200	5.942	31.039	0.000
0.300	0.300	5.914	30.959	0.000
0.400	0.400	5.888	30.880	0.000

THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 0.30 MI VELOCITY = 9.818 MI/D
TEMP. = 30.0 ½C ELEV = 256.00 FT SATURATION D.O. = 7.651 MG/L
Ka = 3.000 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0046 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF	TOTAL DISTANCE (MI) FROM	D.O.	CBODu	NBODu

SEGMENT	BEGINNING	(mg/l)	(mg/l)	(mg/l)
0.000	0.400	6.573	11.738	0.000
0.100	0.500	6.586	11.710	0.000
0.200	0.600	6.599	11.682	0.000
0.300	0.700	6.611	11.654	0.000

****

THE VARIABLES FOR SECTION 3 ARE:

SEGMENT LENGTH = 1.30 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 ½C ELEV = 245.00 FT SATURATION D.O. = 7.654 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0147 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 3 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.700	6.802	5.709	0.000
0.100	0.800	6.807	5.682	0.000
0.200	0.900	6.812	5.654	0.000
0.300	1.000	6.817	5.627	0.000
0.400	1.100	6.823	5.600	0.000
0.500	1.200	6.828	5.573	0.000
0.600	1.300	6.833	5.546	0.000
0.700	1.400	6.838	5.519	0.000
0.800	1.500	6.843	5.493	0.000
0.900	1.600	6.847	5.466	0.000
1.000	1.700	6.852	5.440	0.000
1.100	1.800	6.857	5.413	0.000
1.200	1.900	6.862	5.387	0.000

1.300	2.000	6.866	5.36_	0.000

****

THE VARIABLES FOR SECTION 4 ARE:

SEGMENT LENGTH = 0.37 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 ½C ELEV = 217.00 FT SATURATION D.O. = 7.661 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0282 MGD D.O.= 6.90 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 4 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	2.000	6.883	4.019	0.000
0.100	2.100	6.893	3.999	0.000
0.200	2.200	6.903	3.980	0.000
0.300	2.300	6.913	3.961	0.000
0.370	2.370	6.920	3.948	0.000

****

SIMULATION COMPLETED

02-10-1988 11:07:21

MODEL SIMULATION FOR TH. HARTWOOD SCHOOL (STAFFORD CO) DISCHARGE TO TRIB TO HORSEPEN RUN

Proposed discharge

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.10 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 0.40 MI VELOCITY = 12.273 MI/D
TEMP. = 30.0 ½C ELEV = 360.00 FT SATURATION D.O. = 7.623 MG/L
Ka = 3.000 /DAY Kr = 0.200 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0050 MGD D.O.= 6.50 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.500	31.200	0.000
0.100	0.100	6.455	31.120	0.000
0.200	0.200	6.412	31.039	0.000
0.300	0.300	6.370	30.959	0.000
0.400	0.400	6.330	30.880	0.000

THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 0.30 MI VELOCITY = 9.818 MI/D
TEMP. = 30.0 ½C ELEV = 256.00 FT SATURATION D.O. = 7.651 MG/L
Ka = 3.000 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0046 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF	TOTAL DISTANCE (MI) FROM	D.O.	CBODu	NBODu

SEGMENT	BEGINNING	(mg/l)	(mg/l)	(mg/l)
0.000	0.400	6.596	17.521	0.000
0.100	0.500	6.595	17.478	0.000
0.200	0.600	6.593	17.436	0.000
0.300	0.700	6.592	17.394	0.000

****

THE VARIABLES FOR SECTION 3 ARE:

SEGMENT LENGTH = 1.30 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 ½C ELEV = 245.00 FT SATURATION D.O. = 7.654 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0147 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 3 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.700	6.771	8.687	0.000
0.100	0.800	6.764	8.645	0.000
0.200	0.900	6.757	8.603	0.000
0.300	1.000	6.750	8.561	0.000
0.400	1.100	6.744	8.520	0.000
0.500	1.200	6.738	8.479	0.000
0.600	1.300	6.733	8.438	0.000
0.700	1.400	6.728	8.397	0.000
0.800	1.500	6.723	8.357	0.000
0.900	1.600	6.719	8.317	0.000
1.000	1.700	6.715	8.276	0.000
1.100	1.800	6.712	8.236	0.000
1.200	1.900	6.709	8.197	0.000

1.300	2.000	6.706	8 [illegible]	0.000

****

THE VARIABLES FOR SECTION 4 ARE:

SEGMENT LENGTH = 0.37 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 ½C ELEV = 217.00 FT SATURATION D.O. = 7.661 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0282 MGD D.O.= 6.90 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 4 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	2.000	6.807	5.387	0.000
0.100	2.100	6.814	5.361	0.000
0.200	2.200	6.821	5.335	0.000
0.300	2.300	6.828	5.309	0.000
0.370	2.370	6.833	5.291	0.000

****

SIMULATION COMPLETED

02-10-1988 11:09:53

MODEL SIMULATION FOR THE HAR...OOD SCHOOL (STAFFORD CO) DISCHARGE TO
TRIB TO HORSEPEN RUN

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.10 MILE FROM THE BEGINNING OF A SEGMENT

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 0.40 MI VELOCITY = 12.273 MI/D
TEMP. = 30.0 ½C ELEV = 360.00 FT SATURATION D.O. = 7.623 MG/L
Ka = 1.500 /DAY Kr = 0.200 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0050 MGD D.O.= 6.50 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.500	31.200	0.000
0.100	0.100	6.438	31.120	0.000
0.200	0.200	6.376	31.039	0.000
0.300	0.300	6.316	30.959	0.000
0.400	0.400	6.257	30.880	0.000

THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 0.30 MI VELOCITY = 9.818 MI/D
TEMP. = 30.0 ½C ELEV = 256.00 FT SATURATION D.O. = 7.651 MG/L
Ka = 1.500 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0046 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF	TOTAL DISTANCE (MI) FROM	D.O.	CBODu	NBODu

SEGMENT	BEGINNING	(mg/l)	(mg/l)	(mg/l)
0.000	0.400	6.558	17.521	0.000
0.100	0.500	6.537	17.478	0.000
0.200	0.600	6.517	17.436	0.000
0.300	0.700	6.497	17.394	0.000

****

THE VARIABLES FOR SECTION 3 ARE:

SEGMENT LENGTH = 1.30 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 ½C ELEV = 245.00 FT SATURATION D.O. = 7.654 MG/L
Ka = 0.750 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0147 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 3 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.700	6.734	8.687	0.000
0.100	0.800	6.710	8.645	0.000
0.200	0.900	6.687	8.603	0.000
0.300	1.000	6.664	8.561	0.000
0.400	1.100	6.642	8.520	0.000
0.500	1.200	6.621	8.479	0.000
0.600	1.300	6.600	8.438	0.000
0.700	1.400	6.580	8.397	0.000
0.800	1.500	6.561	8.357	0.000
0.900	1.600	6.542	8.317	0.000
1.000	1.700	6.523	8.276	0.000
1.100	1.800	6.505	8.236	0.000
1.200	1.900	6.488	8.197	0.000

1.300	2.000	6.471	8.157	0.000

****

THE VARIABLES FOR SECTION 4 ARE:

SEGMENT LENGTH = 0.37 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 ½C ELEV = 217.00 FT SATURATION D.O. = 7.661 MG/L
Ka = 0.750 /DAY Kr = 0.150 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0282 MGD D.O.= 6.90 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 4 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	2.000	6.699	5.387	0.000
0.100	2.100	6.692	5.361	0.000
0.200	2.200	6.685	5.335	0.000
0.300	2.300	6.678	5.309	0.000
0.370	2.370	6.673	5.291	0.000

****

SIMULATION COMPLETED

02-10-1988 11:31:31

Sensitivity Run #2

K_1 doubled

MODEL SIMULATION FOR THE HARTWOOD SCHOOL (STAFFORD CO) DISCHARGE TO TRIB TO HORSEPEN RUN

==========

THE BACKGROUND CONDITIONS ARE:

FLOW= 0.0000 MGD D.O.= 0.000 MG/L CBODu= 0.00 MG/L NBODu= 0.00 MG/L

OUTPUT WILL BE GENERATED EVERY 0.10 MILE FROM THE BEGINNING OF A SEGMENT

****

THE VARIABLES FOR SECTION 1 ARE:

SEGMENT LENGTH = 0.40 MI VELOCITY = 12.273 MI/D
TEMP. = 30.0 ½C ELEV = 360.00 FT SATURATION D.O. = 7.623 MG/L
Ka = 3.000 /DAY Kr = 0.400 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE DISCHARGE AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0050 MGD D.O.= 6.50 MG/L CBODu= 31.20 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 1 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.000	6.500	31.200	0.000
0.100	0.100	6.376	31.039	0.000
0.200	0.200	6.257	30.880	0.000
0.300	0.300	6.142	30.721	0.000
0.400	0.400	6.032	30.563	0.000

****

THE VARIABLES FOR SECTION 2 ARE:

SEGMENT LENGTH = 0.30 MI VELOCITY = 9.818 MI/D
TEMP. = 30.0 ½C ELEV = 256.00 FT SATURATION D.O. = 7.651 MG/L
Ka = 3.000 /DAY Kr = 0.300 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0046 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

. . . . . .

THE RESULTS FOR SECTION 2 ARE:

DISTANCE (MI) FROM HEAD OF	TOTAL DISTANCE (MI) FROM	D.O.	CBODu	NBODu

SEGMENT	BEGINNING	(mg/l)	(mg/l)	(mg/l)
0.000	0.400	6.441	17.356	0.000
0.100	0.500	6.405	17.272	0.000
0.200	0.600	6.370	17.189	0.000
0.300	0.700	6.338	17.106	0.000

****

THE VARIABLES FOR SECTION 3 ARE:

SEGMENT LENGTH = 1.30 MI VELOCITY = 4.909 MI/D
TEMP. = 30.0 ½C ELEV = 245.00 FT SATURATION D.O. = 7.654 MG/L
Ka = 1.500 /DAY Kr = 0.300 /DAY Kn = 0.000 /DAY

The k rates shown are at 20 degrees C. The model corrects them.

FOR THE TRIBUTARY AT THE BEGINNING OF THE SEGMENT:

FLOW= 0.0147 MGD D.O.= 6.89 MG/L CBODu= 3.00 MG/L NBODu= 0.00 MG/L

THE RESULTS FOR SECTION 3 ARE:

DISTANCE (MI) FROM HEAD OF SEGMENT	TOTAL DISTANCE (MI) FROM BEGINNING	D.O. (mg/l)	CBODu (mg/l)	NBODu (mg/l)
0.000	0.700	6.671	8.573	0.000
0.100	0.800	6.627	8.490	0.000
0.200	0.900	6.586	8.408	0.000
0.300	1.000	6.547	8.327	0.000
0.400	1.100	6.511	8.247	0.000
0.500	1.200	6.476	8.168	0.000
0.600	1.300	6.444	8.089	0.000
0.700	1.400	6.413	8.011	0.000
0.800	1.500	6.385	7.934	0.000
0.900	1.600	6.358	7.858	0.000
1.000	1.700	6.333	7.782	0.000
1.100	1.800	6.310	7.707	0.000
1.200	1.900	6.288	7.633	0.000

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Stafford County, Virginia.

PUBLIC COMMENT PERIOD: XXX, 2012 to 5:00 p.m. on XXX, 2012

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Stafford County School Board, 31 Stafford Ave, Stafford, VA 22554, VA0060348

NAME AND ADDRESS OF FACILITY: Hartwood Elementary School, 14 Shackleford Well Rd, Hartwood, VA 22406

PROJECT DESCRIPTION: Stafford County School Board has applied for a reissuance of a permit for the public Hartwood Elementary School. The applicant proposes to release treated sewage wastewaters from the school at a rate of 0.0078 million gallons per day into a water body. The sludge will be disposed by pump and haul to the Little Falls Run WWTP. The facility proposes to release the treated sewage in the Horsepen Run, UT in Stafford County in the Rappahannock watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, cBOD, Total Suspended Solids, TKN, Total Residual Chlorine, and Dissolved Oxygen.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the documents at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.
Name: Alison Thompson
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3834 E-mail: Alison.Thompson@deq.virginia.gov Fax: (703) 583-3821

Revised 2/2003

State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	Hartwood Elementary School
NPDES Permit Number:	VA0060348
Permit Writer Name:	Alison Thompson
Date:	2/14/2012

Major [ ] **Minor** [X] **Industrial** [ ] **Municipal** [X]

I.A. Draft Permit Package Submittal Includes:	**Yes**	**No**	**N/A**
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?	X		
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?			X
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations?	X		
8. Whole Effluent Toxicity Test summary and analysis?			X
9. Permit Rating Sheet for new or modified industrial facilities?			X

I.B. Permit/Facility Characteristics	**Yes**	**No**	**N/A**
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	X		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?		X	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?		X	
a. Has a TMDL been developed and approved by EPA for the impaired water?		X	
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?		X	
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?			X
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?		X	

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs
(To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

II.C. Technology-Based Effluent Limits (POTWs)	Yes	No	N/A
1. Does the permit contain numeric limits for ALL of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?		X	
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	X		
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?		X	

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?	X		

II.F. Special Conditions – cont.	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?			X

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		

List of Standard Conditions – 40 CFR 122.41

Duty to comply	Property rights	Reporting Requirements
Duty to reapply	Duty to provide information	Planned change
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance
	Monitoring and records	Transfers
Duty to mitigate	Signatory requirement	Monitoring reports
Proper O & M	Bypass	Compliance schedules
Permit actions	Upset	24-Hour reporting
		Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?			

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	Alison Thompson
Title	Water Permits Technical Reviewer
Signature	
Date	2/14/12